

AMENDMENTS TO THE CLAIMS

Claims 1-20 (Cancelled)

21.¹ (New) A metallocene catalyst component for producing polyolefins according to formula (I):



or according to formula (II):



wherein:

- each Cp is a substituted or unsubstituted cyclopentadienyl ring with ^a~~the~~ bridge-head position of at least one of the cyclopentadienyl rings being occupied by a silicon atom;
- each R is the same or different and is hydrogen or a hydrocarbyl radical containing from 1 to 20 carbon atoms or two carbon atoms are joined together to form a C₄ - C₆ ring;
- R'' is a structural bridge between two Cp rings or between a Cp ring and a heteroatom ligand X;
- M is a group IIIB, IVB, VB or VIB metal from the Periodic Table of Elements;
- Q is a hydrocarbyl radical having from 1 to 20 carbon atoms, a hydrocarboxy radical having from 1 to 20 carbon atoms or a halogen and can be the same or different from each other;
- n is an integer from 0 to 4;
- g is 1 or 2; and

X is a heteroatom ligand with one or two lone pair electrons and selected from the elements in group VA or VIA from the Periodic Table of Elements/~~which can be substituted or unsubstituted~~

~~22.~~² (New) The metallocene catalyst component of claim 21 wherein the number of substituents on each cyclopentadienyl ring is no more than two.

~~23.~~³ (New) The metallocene catalyst component of claim 21 comprising:

- (a) at least one cyclopentadienyl~~type~~ group having at least one substituent at the 3 or 5 position; or
- (b) at least one fluorenyl~~type~~ group having at least one substituent at the 3 or 6 position or at the 2 or 7 position; or
- (c) at least one indenyl~~type~~ group having at least one substituent at the 2 or 4 position.

~~24.~~⁴ (New) The metallocene catalyst component of claim 23 comprising:

- (a) at least one cyclopentadienyl~~type~~ group having two substituents at the 3 and 5 positions; or
- (b) at least one fluorenyl~~type~~ group having two substituents at the 3 and 6 positions or at the 2 and 7 positions; or
- (c) at least one indenyl~~type~~ group having two substituents at the 2 and 4 positions.

~~25.~~⁵ (New) The metallocene catalyst component of claim 23 wherein R" is an ethylene or dimethylsilyl group.

~~26.~~⁶ (New) The metallocene catalyst component of claim 25 wherein M is zirconium or titanium.

~~27.~~⁷ (New) The metallocene catalyst component of claim 26 wherein Q is chlorine.

~~28.~~⁸ (New) The metallocene catalyst component of claim 21 wherein the heteroatom ligand X is selected from the group consisting of nitrogen, phosphorus, oxygen and sulfur.

~~29.~~⁹ (New) The metallocene catalyst component of claim 21 conforming to formula (I) in which one Cp is a cyclopentadienyl~~type~~ group and another Cp is a fluorenyl~~type~~ group to provide a bridged cyclopentadienyl-fluorenyl ligand structure in which the bridgehead position of at least one of said fluorenyl and said cyclopentadienyl is occupied by a silicon atom.

~~30.~~¹⁰ (New) The metallocene catalyst component of claim 29 wherein the bridgehead position of said fluorenyl-type group is occupied by a silicon atom.

~~31.~~¹¹ (New) The metallocene catalyst component of claim 30 wherein the bridgehead ~~carbon atom~~ position of said cyclopentadienyl~~type~~ group is occupied by a silicon atom.

~~32.~~¹² (New) The metallocene catalyst component of claim 31 wherein said fluorenyl group has at least two substituents at the 2 and 7 positions or at the 3 and 6 positions.

~~33.~~¹³ (New) The metallocene catalyst component of claim 32 wherein said cyclopentadienyl~~type~~ group is substituted at at least one of the 3 and 5 positions.

~~34.~~¹⁴ (New) The metallocene catalyst component of claim 33 wherein said cyclopentadienyl~~type~~ group has two substituents at the 3 and 5 positions.

~~35.~~¹⁵ (New) The metallocene catalyst component of claim 21 conforming to formula (I) in which each of said Cp's is an indenyl group to provide a bridged bis-indenyl ligand structure in which the bridgehead ~~carbon atom~~^{position} of at least one of said indenyl groups is occupied by a silicon atom.

~~36.~~¹⁶ (New) The metallocene catalyst component of claim 35 wherein each of said indenyl groups is substituted at the 2 position.

~~37.~~¹⁷ (New) The metallocene catalyst component of claim 21 conforming to formula (II) in which CpR_n is a fluorenyl ~~group~~^{type} in which the bridgehead position of said fluorenyl group is occupied by a silicon atom.

~~38.~~¹⁸ (New) The metallocene catalyst component of claim 37 wherein said fluorenyl group has at least two substituents at the 2 and 7 positions or at the 3 and 6 positions.

~~39.~~¹⁹ (New) A metallocene catalyst system comprising the metallocene catalyst component of claim 21 and further comprising an activating agent having an ionizing action.

~~40.~~²⁰ (New) The metallocene catalyst system of claim 39 wherein the activating agent is alumoxane.

~~41.~~²¹ (New) The metallocene catalyst system of claim 39 wherein the alumoxane is methylalumoxane.

~~42.~~²² (New) The metallocene catalyst system of claim 39 further comprising an inert inorganic support.

~~43.~~ ²³ (New) The metallocene catalyst system of claim 42 wherein the inorganic support is silica having a specific surface area within the range of 200-700 m²/g and a pore volume within the range of 0.5-3 ml/g.

44. ²⁴

(New) A process for the polymerization of an olefin comprising:

(a) providing a metallocene catalyst system comprising:

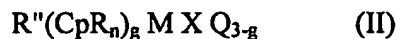
(1) a metallocene catalyst component for producing polyolefins

according to formula (I):

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or according to formula (II):



wherein:

- each Cp is a substituted or unsubstituted cyclopentadienyl ring with ^athe bridge-head position of at least one of the cyclopentadienyl rings being occupied by a silicon atom;
- each R is the same or different and is hydrogen or a hydrocarbyl radical containing from 1 to 20 carbon atoms or two carbon atoms are joined together to form a C₄ - C₆ ring;
- R'' is a structural bridge between two Cp rings or between a Cp ring and a heteroatom ligand X;
- 15 - M is a group IIIB, IVB, VB or VIB metal from the Periodic Table of Elements;
- Q is a hydrocarbyl radical having from 1 to 20 carbon atoms, a hydrocarboxy radical having from 1 to 20 carbon atoms or a halogen and can be the same or different from each other;
- n is an integer from 0 to 4;
- 20 - g is 1 or 2; and
- X is a heteroatom ligand with one or two lone pair electrons and selected from the elements in group VA or VIA from the Periodic Table of Elements/~~which can be substituted or unsubstituted~~; and

(2) an activating agent for said metallocene catalyst component having an ionization action;

(b) introducing an alpha olefin and said metallocene catalyst system into a polymerization reaction zone;

(c) maintaining said reaction zone under polymerization conditions and polymerizing said alpha olefin to produce a polymer of said alpha olefin; and

(d) extracting said polymer from said reaction zone.

~~45.~~¹⁵ (New) The process of claim 44 wherein said alpha olefin comprises ethylene and the polymer recovered from said reaction zone is polyethylene.

~~46.~~²⁶ (New) The process of claim 44 wherein said alpha olefin comprises propylene and the polymer recovered from the reaction zone is selected from the group consisting of isotactic polypropylene and syndiotactic polypropylene.